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# Newsletter

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## Colorectal Cancer

BY: MELISSA HALM, MPH

Over the past 10 years, colorectal cancer has received an increasing amount of media coverage. Why? The Centers for Disease Control and Prevention (CDC) launched the Screen for Life Campaign in early 1999 [1]. This campaign partnered the CDC with the entertainment industry in an effort to educate the public about colorectal cancer and prevention measures. What is the primary campaign message about colorectal cancer? “Screening saves lives.” The CDC estimates 60% of colorectal cancer associated deaths could have been prevented with proper screening [1]. In addition, education about colorectal cancer can arm people with the tools to make informed decisions about their health management [1].

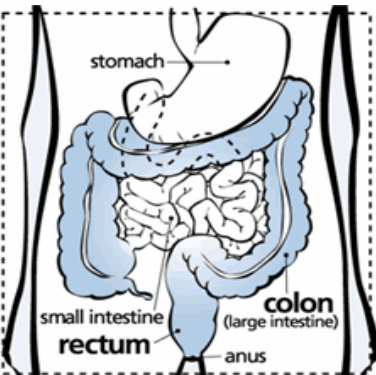


Figure 1: Illustration of the digestive tract [1]

### What is colorectal cancer?

Colorectal cancer occurs in 2 parts of the lower digestive tract: the colon and the rectum [1-3]. The illustration in Figure 1 demonstrates the anatomy of the digestive tract. Cancer primarily develops from pre-cancerous polyps in the tissue of the colon or rectum [1-3]. A polyp develops due to the uncontrolled growth of tissue cells. The uncontrolled cell growth is caused by an abnormality in the cell division cycle [3]. Subsequently, cells do not adhere to the normal life cycle of

a cell and begin to grow outside the normal boundaries of the tissue, causing the formation of a polyp [3].

### What are the symptoms of colorectal cancer?

The symptoms for colorectal cancer can range from asymptomatic to abnormalities in the stool. The National Cancer Institute lists the following as symptoms of colorectal cancer [4]:

- Having diarrhea or constipation
- Feeling that your bowel does not empty completely
- Finding blood (either bright red or very dark) in your stool
- Finding your stools are narrower than usual
- Frequently having gas pains or cramps, or feeling full or bloated
- Losing weight with no known reason
- Feeling very tired all the time
- Having nausea or vomiting

Due to the non-specificity of these symptoms, individuals with these symptoms should seek medical attention to determine the cause of the symptoms.

### What are the risk factors for colorectal cancer?

Risk factors for colorectal cancer can be categorized into 2 groups: Lifestyle Choices and Personal History [1-5]. For a list of these risk factors, refer to Figure 2. Risk factors categorized as lifestyle choices can be minimized to decrease a person's risk of developing polyps and colorectal cancer. The risk factors categorized as personal history can not be minimized and should be noted when discussing your health management with your health care provider.

# Hospital Hygiene: Stopping the Spread of Nosocomial Infections

BY: APRIL CLARK, DrPH

It is often assumed that hospitals are among the cleanest and most germ free places in the world. However, the morbidity and mortality related to nosocomial infections, or health care acquired infections, should make us rethink this assertion. The Centers for Disease Control (CDC) conducted a surveillance study based on data from 1990-2002. United States surveillance data from 2002 shows that there were 1.7 million nosocomial infections with 76% of those infections occurring outside of the Intensive Care Unit (ICU) [1]. Additionally, there were nearly 100,000 deaths associated with those nosocomial infections [1]. Nosocomial infections often affect patients in health care facilities with reduced immune systems. For instance, in the surveillance study conducted by the CDC, it was found that babies housed in high risk nurseries were diagnosed with nosocomial infections 37% more than babies in the well baby nurseries [1]. Although nosocomial infections are on the rise, simple hospital hygiene can be used to thwart the spread of nosocomial infections.

One of the main campaigns used to reduce nosocomial infections is promotion of hand hygiene of health care professionals [2]. One hand hygiene campaign used visual posters displayed in 250 areas throughout an urban hospital. The messages on the posters were related to nosocomial infection, cross transmission, and hand hygiene. Through this three-year hand hygiene promotion campaign, researchers in Switzerland saw an 18% improved compliance rate in hand hygiene [2]. After the campaign, researchers found a significantly higher frequency of hand washing among nurses and nursing assistants, but did not see this same increase among physicians. Additionally over the three-year period, nosocomial infections were significantly reduced from 16.9% to 9.9% (2.16/1,000 patient days to 0.93/1,000 patient days p=0.04) [2].

Hospitals are also implementing their own techniques for increasing hospital personnel hand washing. These techniques range from verbal and written reprimands

to flyers requesting patients to remind hospital personnel to wash their hands before treatment [3]. Hospitals have found that these techniques have significantly increased hand washing and decreased nosocomial infections in their facility [3].

Hand hygiene can be achieved in many ways. The CDC recommends the following hand washing procedure for health care professionals:

- Wet hands first with water (avoid HOT water)
- Apply 3 to 5 ml of soap to hands
- Rub hands together for at least 15 seconds
- Cover all surfaces of the hands and fingers
- Rinse hands with water and dry thoroughly
- Use paper towel to turn off water faucet [4]

Hand hygiene may be the single best way to avoid nosocomial infections. When health care professionals frequently wash their hands and use sterile gloves, cross contamination can be avoided. However, many health care professionals are not compliant with the CDC's recommendations. Compliance rates to correct hand hygiene linger around 40% in hospital health care professionals [4]. Hand hygiene must become part of hospital culture. Through education, workplace reminders, and system-level changes such as increased sinks throughout the hospitals and increased access to alcohol-based hand cleaners, health care professionals can make necessary steps to reduce the incidence of nosocomial infections. ■

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Figure 2: Risk factors of colorectal cancer [1-5].

Lifestyle Choices	Personal History
Alcohol	Age (>50 years old)
Tobacco Use	History of polyps*
Diet high in fat and consumption of processed foods	History of bowel disorders (ulcerative colitis or Crohn's Disease)*.
Diet low in vegetables and fruit	Personal or family history of colorectal cancer*
Lack of exercise	Radiation therapy for other cancers*
Overweight	Acromegaly (Growth hormone disorder)*
Type 2 Diabetes	Inherited syndromes of the colon: Familial adenomatous polyposis Hereditary nonpolyposis colorectal cancer Race or ethnic background (African American and Ashkenazi Jews) *

\* If a person has a personal or family history of any of the indicated situations or conditions, the person is considered to have an increased risk of acquiring colorectal cancer

ing schedules for individuals 50 years of age or older at average risk of colorectal cancer [5].

Individuals at an increased risk of colorectal cancer will have a different suggested screening schedule than individuals with an average risk of colorectal cancer. The American Cancer Society suggests individuals with an increased risk of colorectal cancer start screening for colorectal cancer earlier and more frequently to help facilitate early colorectal cancer detection [3,5]. Consult your physician about your risk of colorectal cancer. Researchers have also noted certain medications can deter the development of colorectal cancer. Such medications include aspirin, ibuprofen, naproxen, Celecoxib, multivitamins, and hormone replacement therapy [2,3]. However, due to the side effects of some of these medi-

Figure 3: Screening methods and suggested procedure schedule for people 50 years of age and older with average risk for colorectal cancer[5].

Screening Method	Schedule
Colonoscopy	Every 10 years
Fecal Occult Blood Test (FOBT)*	Yearly
Flexible Sigmoidoscopy*	Every 5 years
Fecal Immunochemical Test (FIT)	Yearly
Virtual Colonoscopy (CT colonography)	Every 5 years
Stool DNA (sDNA) test	See physician

\* The FOBT and Flexible Sigmoidoscopy are best used simultaneously.

For your information

If you want a copy of your exam results, please complete and sign a release form while you are visiting the Clinic for your examination. The form is called *Privacy Act Disclosure Authorization and Accounting Record (DAAR)*, or NASA Form 1536.

Colorectal cancer and colonic polyps are monitored in LSAH participants. Astronauts could be at an increased risk for colorectal cancer because of their unique exposures, particularly radiation exposure. However, LSAH has not seen an increased incidence in colorectal cancer or colonic polyps in astronauts when compared to the comparison population. Refer to Figure 4 for the incidence of colorectal cancer and colonic polyps in both populations.

Figure 4: Incidence of colon cancer and colonic polyps in Astronauts\* and the Comparison Population\*

Diagnosis	Population	
	Astronauts**	Comparison**
Colonic Polyps	11	13
Colorectal Cancer	0.57	0.41

\* Includes all active and inactive LSAH participants  
\*\* cases per 100 people

cations, people should consult their primary care physician before use [2,3].

Being diagnosed with colorectal cancer can be frightening, especially if the disease is not diagnosed early. Luckily, this disease can be diagnosed early, and even prevented with proper screening. It is time to get educated about colorectal cancer. Talk to your physician to determine the best prevention plan for you.■

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# Tinnitus: Will That Ringing Ever Stop?

By: **RICHARD W. DANIELSON, Ph.D,**  
JSC Clinical Audiologist

The impact of tinnitus (the sensation of hearing a sound without any external stimulation) may seem to be a relatively benign health issue. Nearly everyone experiences tinnitus at some point in their life; most cases resolve quickly and spontaneously. However, long-standing tinnitus can appreciably disturb sleep, concentration and emotions. Such ringing, hissing, or roaring sounds can cause frustration, anger, or irritability; especially when the sufferer is told, “*You’ll just have to get USED to that ringing.*” While it’s true that there is no single (or quick) cure for tinnitus, recent advances in basic and applied clinical research confirm that it’s inappropriate to tell someone to “*Just go home and learn to live with it, because nothing can be done.*” In some cases, such brusque recommendations not only frustrate the anxious patient, but can actually exacerbate the condition. Fortunately, tinnitus relief can (in at least some cases) come from just gaining knowledge of about the nature of tinnitus and some of the options for tinnitus management.

Tinnitus sufferers are not alone. Over 50 million Americans experience some kind of tinnitus [1]. While most people report their tinnitus is mild or moderate (reported to be “*annoying or unpleasant*”), as many as 12 to 18% of these individuals report tinnitus as severe or debilitating [2, 3]. They find it difficult to go to sleep at night, concentrate, and often report that it interferes with their hearing. For some people, the impact of tinnitus may be worse than the impact of an accompanying hearing loss [4].

Over 200 conditions have been identified as causes of tinnitus so far. Obviously, noise-related hearing loss is likely to be associated with tinnitus, particularly among veterans of military service [5], but tinnitus can also be related to medications, hearing disorders, changes in vascular blood flow, and temporomandibular joint (TMJ) disorders. Most of the patients experiencing tinnitus report that the perception is only annoying when their environment is very quiet (like a bedroom), so “sound deprivation” is often an associated cause.

Contrary to customary thinking, the source of tinnitus is not usually *in the ear*, but is generated in *the central auditory system* (in higher neural pathways and brain centers) after being triggered by inner ear damage. One perspective is that tinnitus is like phantom limb pain (in which an amputee still feels tingling and pain in missing limbs) [6, 7, 8]. Using the brain’s property of neural plasticity, nerve cells are rewired to assume new functions, causing perception of tinnitus in the brain, even though the generator sources (e.g., sensory cells) in the ear have been damaged [9].

Jastreboff’s neurophysiological model of tinnitus [9] suggests that the auditory system is closely connected with the limbic system, the part of brain that controls emotions and an automatic response of the body to danger. Most auditory signals cause the brain to habituate to that sound (e.g., when you eventually don’t realize that your home’s mantel clock always chimes the hour). However, sounds that are new, or associated with a negative experience (e.g., footsteps in a darkened parking garage) can evoke an aversive emotional response that triggers the body to prepare for “fight or flight.” The limbic system (which puts the nervous system on such a higher alert) has been shown (with special brain imaging) to be more active when patients experience their tinnitus [11], suggesting direct links between this brain center and the inner ear, creating a unique sensory-neuronal network. In Jastreboff’s model, when this network detects a tinnitus signal, aversive reactions of the autonomic nervous system are triggered (to confirm that the tinnitus is still present). This “*detection-response-detection...*” cycle can create an unending enhancement of the tinnitus, with an unrelenting loop of annoyance.

Because tinnitus may be symptomatic of a more serious disorder, it is essential that a differential diagnosis always be sought (with medical history, audiological tests, and medical examination), especially if you have tinnitus that occurs suddenly, has no apparent cause, or is accompanied by hearing loss or dizziness. Once you have been evaluated and your current medications and diet have been reviewed with

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*Tinnitus, continued from page 3*

your medical professional to rule out any active disease processes or conditions that may be treated by medical or surgical intervention, tinnitus management can take place. Elements of this management program usually contain educational counseling, stress reduction, and/or the use of therapeutic sound. The goal of clinical tinnitus management is not to “cure” tinnitus, but to reduce the perception of tinnitus until it is no longer a negative, controlling factor in the person’s life, and to provide relief (and something you can ‘live with”).

Perhaps the most common tinnitus management technique used is to avoid sound deprivation (e.g., by listening to fans, soft music, or table-top sound generators in a bedroom, where tinnitus becomes more prominent). Similarly, an ear-level masker or hearing aid amplification (when applied appropriately) can sometimes be an effective form of acoustic therapy [12]. In some cases, some medications (e.g., sedatives, given under the direction of a knowledgeable physician, and only when absolutely necessary) may provide relief. An individualized management plan, called Tinnitus Retraining Therapy (TRT) [12], has been developed that uses a combination of intense counseling (taking up to 18-24 months) and low level, broad-band noise to achieve the habituation of tinnitus. This habituation is such that the patient is no longer aware of their tinnitus, except when they focus their attention on it. Another recent development is Neuromonics Tinnitus Treatment (NTT) [13], an acoustic-based treatment that involves assessment, monitoring, support, and education from an audiology specialist over about a six-month treatment period. NTT uses an electronic processor that delivers neurological (music-based) stimulation to the wearer’s ear for 2-3 hours per day. Basic and applied research continues to evaluate and verify the functionality of NTT and TRT, which are available at only a few clinics nationwide.

*Colon Cancer, continued from page 1*

## How can colorectal cancer be prevented?

Most colorectal cancers can be prevented [1-5]. Prevention techniques will vary with age, as well as personal history. The first step for everyone, regardless of age or personal history, is to limit their risk factors in the lifestyle choices category and become educated

Obviously you should PROTECT YOURSELF from further hearing damage by avoiding loud places and by using hearing protection when exposed to hazardous noise. Keep yourself as fully informed as you can about tinnitus, by keeping well-informed about current research developments and updated on management options. The American Tinnitus Association’s [www.tinnitus.org](http://www.tinnitus.org) is an excellent and credible web-based source of evidence-based information about tinnitus and will help expand your knowledge. Tinnitus is usually not a sign of a serious, ongoing medical condition, and CAN be made less offensive through effective education and coping strategies.■

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about prevention options and the signs and symptoms of colorectal cancer [1-5].

There are several different screening options. Consult your doctor to determine the method or methods that are most appropriate for you. Refer to Figure 3 for a list of screening methods and suggested screen-

*continued on page 5*